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Evaluating an Abbreviated Version of the PATHS Curriculum Implemented by School Mental Health Clinicians


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EVALUATING AN ABBREVIATED VERSION OF THE PATHS CURRICULUM IMPLEMENTED BY SCHOOL MENTAL HEALTH CLINICIANS

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TriHealth School-Based Behavioral Health Program

When evidence-based prevention programs are implemented in schools, adaptations are common. It is important to understand which adaptations can be made while maintaining positive outcomes for students. This preliminary study evaluated an abbreviated version of the Promoting Alternative Thinking Strategies (PATHS) Curriculum implemented by school-based mental health clinicians in preschool/kindergarten classrooms. Results suggest that students ($N = 80$) demonstrated increases in emotional understanding and prosocial behavior. Children with low initial levels of problem behavior demonstrated large and continual increases in prosocial behavior over the entire course of the intervention, whereas children with high initial levels of problem behavior only demonstrated small gains in prosocial behavior during the first half of the intervention. These preliminary results support the general effectiveness of the adapted intervention, but also suggest the need for additional intervention to produce meaningful and sustained behavioral gains for higher-need students.
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There is growing recognition that to increase academic success we must promote the social, emotional, and behavioral health of our nation's students (President's New Freedom Commission on Mental Health, 2003). To foster social, emotional, and behavioral health, schools are increasingly likely to implement social emotional learning (SEL) programs, a type of universal prevention that teaches students to understand and manage emotions, establish positive relationships, engage in effective interpersonal problem solving and conflict resolution, and set and achieve positive goals (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Greenberg et al., 2003). Several evidence-based SEL programs exist, and a significant body of research demonstrates the positive effect of SEL on a range of social, emotional, behavioral, and academic outcomes (Durlak et al., 2011). Yet, there remain gaps in our understanding of SEL, particularly when implemented under "real-world" conditions.

Although evidence-based programs have demonstrated the ability to produce outcomes through rigorous, tightly controlled efficacy studies, it is also important to know whether these programs are effective under more typical circumstances (Dariotis, Bumbarger, Duncan, & Greenberg, 2008). Research clearly links high levels of program integrity and fidelity to better outcomes (Durlak & DuPre, 2008), but this ideal is rarely achieved in the "real world," and may be particularly difficult to achieve in schools (Dariotis et al., 2008; Durlak, 1998). Adaptations to evidence-based prevention programs are common, and in some cases may help to maintain or improve outcomes (Dariotis et al., 2008; Durlak & DuPre, 2008; Forman et al., 2013). Thus, research is needed to understand "What adaptations can be made to the intervention . . . while maintaining positive client outcomes found in efficacy studies" (Forman et al., 2013, p. 83). In this preliminary study, we evaluated an SEL program implemented under real-world constraints and circumstances that resulted in adaptations to the program's dosage and implementers. More specifically, we examined the outcomes of an abbreviated version of the Promoting Alternative Thinking Strategies (PATHS)

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Preschool/Kindergarten Curriculum implemented by school mental health clinicians. To determine whether the intervention was more effective for certain groups of students, we examined differences between boys and girls, and between students with high and low initial levels of problem behavior.

The PATHS Curriculum

The PATHS Curriculum is an evidence-based SEL program that aims to improve social and emotional competency and reduce problem behaviors of elementary school children through a series of lessons and extension activities (Greenberg, Kusche, & Mihalic, 1998). The program is based on a model of development in which affect, behavior, and cognition are intricately linked in the developmental of social and emotional competence. The model purports that during early development emotional understanding and regulation are precursors to behavioral regulation and problem solving (Greenberg & Kusché, 1993). Substantial research supports the effectiveness of PATHS in improving social and emotional competence and reducing internalizing and externalizing behaviors for a wide array of children (Domitrovich, Cortes, & Greenberg, 2007; Greenberg, Kusche, Cook, & Quamma, 1995; Kam, Greenberg, & Kusche, 2004).

Program Dosage

Dosage refers to the quantity (i.e., how much) of the original program that is actually delivered (Durlak & DuPre, 2008). Examining an abbreviated version of PATHS is important because reductions in dosage are one of the most common adaptations to evidence-based prevention programs (Durlak, 1998; Durlak & DuPre, 2008; Metropolitan Area Child Study Research Group [MACSRG], 2002; Moore, Bumbarger, & Cooper, 2013). In fact, Durlak (1998) estimates that 23% to 81% of evidence-based prevention programs are omitted when implemented in the real world. Lack of time and academic pressures are primary reasons for reduced dosage in schools (Dariotis et al., 2008; Moore et al., 2013). Under conditions of high pressure and few resources, “it is prudent to identify how much is good enough” when it comes to dosage and other aspects of implementation integrity (Owens et al., 2014, p. 104).

Despite little research on the impact of dosage (Greenberg, Domitrovich, & Bumbarger, 2001), there is some indication that low doses of evidence-based programs can have a positive impact on students (Cross, Gottfredson, Wilson, Rorie, & Connell, 2010; MACSRG, 2002). However, low doses may primarily affect student knowledge, with larger doses needed for changes in attitudes and behaviors (Connell, Turner, & Mason, 1985). One study has examined dosage of the PATHS Curriculum, finding that dosage was unrelated to changes in peer ratings of aggression, or teacher ratings of prosocial and problem behaviors, but that higher dosage was associated with a more positive classroom climate (Conduct Problems Prevention Research Group [CPPRG], 1999). Further research is needed before we can be confident in the outcomes associated with reduced doses of PATHS and other SEL programs.

Program Implementers

The effectiveness of SEL programs implemented by school-based clinicians is understudied. A meta-analysis of SEL programs found that programs implemented by teachers were more effective than those implemented by nonschool personnel, such as university researchers or outside consultants (Durlak et al., 2011). The meta-analysis did not examine the effectiveness of programs implemented by school-based professionals who are not classroom teachers. Additional research on this group is warranted. As members of the school community, school-based mental health clinicians’ familiarity to students may lead to greater trust and respect, making them more effective implementers than nonschool personnel.

The PATHS Curriculum is intended to be implemented by teachers, and although the developers support involvement of other school-serving professionals, there is no known research on implementation of PATHS in schools by other professionals (M. T. Greenberg, personal communication, April 28, 2013). This study is the first known to examine implementation by school-based mental health clinicians.

Student Characteristics

The influence of student characteristics on program outcomes is another area in need of additional research. We know little about which student characteristics may influence the impact of PATHS and other SEL programs on outcomes (Greenberg et al., 2001). Theoretically, universal prevention programs should have a positive effect on all students who receive the program; however, additional investigation is needed into who actually benefits, as outcomes may vary based on factors such as gender and preexisting level of difficulty with social, emotional, or behavior functioning (CPPRG, 2010; Durlak et al., 2011).

Gender. Several studies of evidence-based prevention programs have examined gender as a moderating factor. Some studies suggest that males and females achieve different positive outcomes (e.g., Swaim & Kelly, 2008; Taylor, Liang, Tracy, Williams, & Seigle, 2002). A recent study found that males benefitted more from an SEL program (e.g., Raimundo, Marques-Pinto, & Lima, 2013) whereas other studies have found that females benefit more from programs to build coping skills and reduce violence (Frydenberg et al., 2004; Griffin, Chen, Eubanks, Brantley, & Willis, 2007). This diversity in findings likely results from the particular skills and behaviors targeted by the program and/or the outcomes measured in the study. CPPRG (2010) found that gender did not influence the effect of PATHS on teacher reports of aggression, hyperactive behavior, or prosocial behavior, but did influence the effect of the intervention on peer reports of aggression and hyperactive behavior, with significant effects for boys but not girls. Given the diversity of findings from other programs and the single study of gender differences in PATHS outcomes, additional research is needed.

Preexisting Difficulties. It is also important to understand whether initial level of need for intervention, as characterized by social, emotional, or behavioral difficulties, may influence the outcomes of SEL programs. Students with higher initial scores for depression, anxiety, and aggression have all been shown to benefit more from universal prevention, as have students from more disadvantaged backgrounds, and those with lower levels of academic achievement (Challen, Noden, West, & Machin, 2010; Reid, Eddy, Fetrow, & Stoolmiller, 1999). In contrast, Raimundo et al. (2013) found that fourth-grade students with pretest scores in the middle quartiles on measures of self-management and peer relations benefitted more from an SEL program than high- and low-quartile peers. Examining the PATHS curriculum, Greenberg et al. (1995) found that second- and third-grade students with low and moderate initial levels of externalizing problems were more likely to improve in defining complex emotion, but students with high externalizing problems improved more in feeling that they could change their emotions and being able to provide examples of basic emotion. Likewise, children with moderate and high initial levels of internalizing problems improved more than low-internalizing children in feeling that they could change their emotions, and understanding how emotions change. Further PATHS research should build on this study by examining other outcomes and age groups.

The Current Study

The current study expands understanding of SEL program effectiveness by examining outcomes of the PATHS Curriculum when adaptations are made to the dosage and implementers.

An abbreviated version of the PATHS Preschool/Kindergarten Curriculum was implemented by school-based mental health clinicians. Using repeated measures, we assessed change in emotional understanding and behavior (prosocial and problem) over the course of PATHS implementation, as well as differences for boys and girls, and children initially high and low in problem behaviors. Based on existing evidence, we hypothesized that students would improve in emotional understanding, prosocial behavior, and problem behavior over the course of the intervention, and that the intervention would be of greater benefit to boys and students with higher preexisting problem behavior.

METHODS

Participants

A total of 80 three- to six-year-old preschool and kindergarten students, enrolled in a public Montessori school in an urban area of the Midwest, participated in this study. Approximately 46.3% of the total sample was female ($n = 37$). Race and socioeconomic information was not gathered for individual participants because of a limited population of student from which to draw participants, and concern that questions about race and socioeconomic status may decrease parents' willingness to consent to the study. However, approximately 75.8% students at the school were African American, with the next largest group being Caucasian (13.7%). In addition, 81.5% of the students at the school were identified as economically disadvantaged, according to the State's Department of Education.

To recruit a convenience sample, consent forms were sent home to parents/guardians of children in all five preschool/kindergarten classrooms at the school. A total of 89 consent forms were returned (approximately 75% of enrolled preschool/kindergarten students). Students were also asked to provide verbal assent before measures were administered to them. In simple, child-friendly language they were told what the task entailed, why we were interested in collecting the data, that their parent/guardian had already provided consent, that participation was optional and could be discontinued at any time, and that the data generated would be confidential. They were then asked whether it was "okay for us to do this activity."

Two students who returned consent forms did not assent to the study, one student had limited English proficiency, and six others withdrew from the school. All nine of these students were removed from the study.

Measures

Prosocial and Problem Behavior. The Social and Emotional Competence (SEC) and the Aggression/Disruptive Behaviors (ADB) subscales of the PATHS Preschool/Kindergarten Student Evaluation (PPKSE, Dominotrovich, Greenberg, Kusché, & Cortes, 2008) were used to measure prosocial and problem behaviors. Each contains 12 items. A version of the measure intended for first- through sixth-grade students was validated using exploratory and confirmatory factor analysis and demonstrated excellent internal reliability (Kam & Greenberg, 1999). In the current study Cronbach's alphas of the SEC ranged from .94 at pretest to .99 at posttest. Cronbach's alphas of the ADB ranged from .96 at midyear to .98 at posttest. To complete the PPKSE, teachers rated students on a Likert scale ranging from 0 (*never or almost never*) to 5 (*almost always*). Individual item ratings were summed and total scores derived for each subscale, with higher scores on the SEC subscale indicating more prosocial behaviors and higher scores on the ADB subscale indicating more problem behaviors (Kam & Greenberg, 1999).

To create a variable representing preexisting problem behavior, we used the pretest ADB subscale to divide students into two groups. Students who had an ADB total score of 12 or less (out of a possible 60 total points on 12 items) were classified as having low preexisting problem

behaviors. Students with a total of score of 13 or more were classified as having high preexisting problem behaviors, as they either demonstrated more aggressive/disruptive behaviors or a few of these behaviors frequently. This created roughly equal groups, with 43 students (53.75%) in the low group and 37 students (46.25%) in the high group.

Emotional Understanding. The Kusche Emotional Inventory (KEI; Kusché, 1985) was used to assess students' emotional understanding. This measure was created specifically to be used with the PATHS curriculum for preschool- and kindergarten-aged children. It consists of 30 items, and has demonstrated good reliability, with internal consistency reliability alphas of .74 to .75 in previous studies (Berzenski & Yates, 2013; Rhoades, Warren, Domitrovich, & Greenberg, 2011). In the current study, Cronbach's alphas ranged from .71 at posttest to .79 at pretest. To complete the measure, children selected one of four cartoon drawings that corresponded to a verbally provided target emotion word. Children received 2 points for the correct response, 1 point for selecting a picture that depicted an emotion of the same valence (positive or negative) as the target word, and 0 points for any other response. Individual item scores were summed to create a total score, with higher scores indicating greater emotional understanding.

Procedures

Emotional understanding and prosocial and problem behaviors were assessed at the following times: (1) the start of the school year (pretest), (2) January (midintervention), and (3) the end of the school year (posttest). The KEI was administered one-on-one by the lead author and trained undergraduate and graduate student assistants. Directions were read aloud and repeated as needed, and children marked their answers on a test booklet. Evaluators also kept track of student answers on a score sheet and ensured correspondence between the score sheet and the test booklet before scoring and summing the measure. It took approximately 10 to 15 minutes to complete the measure. Teachers were provided with a copy of the PPKSE to independently complete for each consented student in their class, and asked to return the measures within a week. The school district and a university Institutional Review Board approved this study.

PATHS Implementation

The PATHS Preschool/Kindergarten Curriculum contains 44 lessons that are designed to be delivered in the classroom setting, two to three times a week, by the classroom teacher. In the current study, 21 lessons were selected and delivered by school-based mental health clinicians—two licensed clinical psychologists and a clinical psychology graduate student—once a week. Factors influencing lesson selection included sequence in the curriculum (earlier lessons were more likely to be delivered), repetitiveness with previous lessons, perceived fit with PATHS goals, and perceived developmental fit with students. Each week, the same 30-minute lesson was delivered to all five classrooms. Teachers were present during delivery of the lessons.

Reduced dosage aside, the intervention was delivered with high intervention integrity. According to records kept by the clinicians, adherence/fidelity was good; across classrooms approximately 24% of lessons were delivered exactly as written, 74% of lessons were delivered with minor deviations from the original format, and 2% of lessons were delivered with major deviations from the original format. Of the 12 recorded adaptations, 11 appear intended to increase the "fit" of the program with the particular classroom or school, and one was related to managing difficult behaviors during the lesson. In approximately 69% of the lessons the majority of students practiced the learned skill, which is an important component of the program. Student responsiveness was high; the clinicians rated 100% of lessons as "seemed understood" or "clearly understood" by students, and 94% of the lessons as "effective" or "very effective."

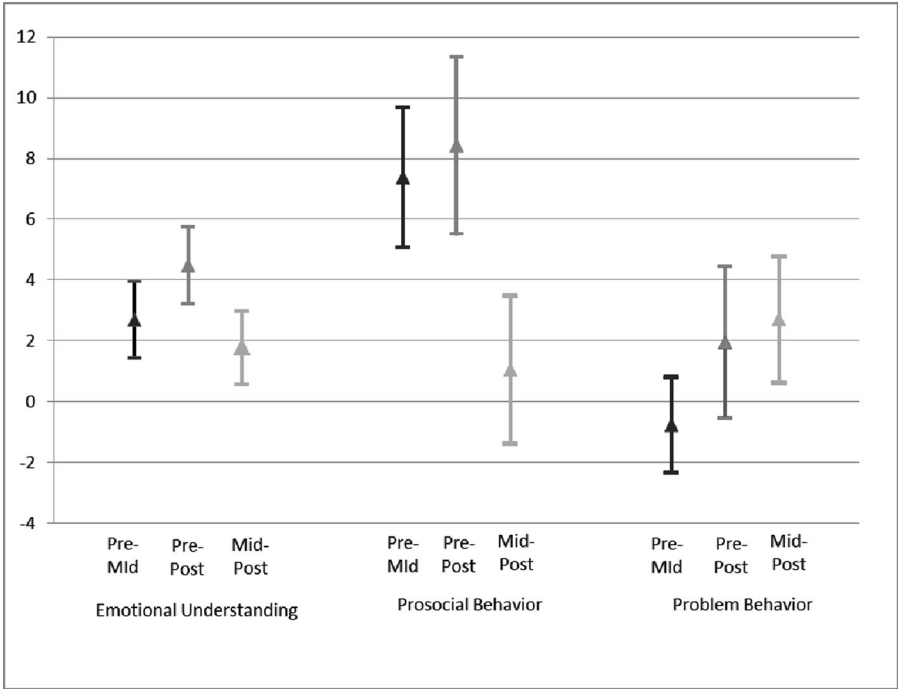


FIGURE 1. Mean differences between time points for the combined sample. Error bars represent 95% confidence intervals. When error bars do not overlap with zero, there is a 95% chance that the mean difference is greater than zero, with higher mean differences indicating larger effects sizes.

Analysis Strategy

The primary analyses in this study are a series of three repeated measures analysis of variance (ANOVA) with time (pretest, midintervention, posttest) serving as a within-subject variable; gender and preexisting level of problem behavior serving as between-subject variables; and emotional understanding, prosocial behavior, and problem behavior serving as dependent variables. Due to problems with heterogeneity of variance created by a shared measure, we did not examine initial level of problem behavior as a between-subject variable when problem behavior was the dependent variable. Because we ran three separate ANOVAs, we used a Bonferroni adjustment to set the acceptable alpha for main and interaction effects at $.05/3 = .017$. Significant main and interaction effects were followed by planned contrasts. The acceptable alpha for these was also set at $.05/3 = .017$ because we compared pretest to midintervention, pretest to posttest, and midintervention to posttest.

We also used Cumming's (2013) "new statistics" approach to explore effect sizes (i.e., mean differences) and 95% confidence intervals of changes over time for the complete sample (Figure 1). Confidence intervals take into account Pearson product-moment correlations between time points (Cumming & Finch, 2005; see Table 1 for correlations) and represent a range of plausible values for the true mean difference of the population. When the confidence intervals do not include 0 we can be 95% confident that the real mean difference is more than 0, with larger absolute mean differences indicating larger effect sizes (Cumming & Finch, 2005).

Table 1
Correlations Among Dependent Variables for Combined Sample

Measure	1	2	3	4	5	6	7	8
1. Emotional understanding T1								
2. Emotional understanding T2	.64**							
3. Emotional understanding T3	.61**	.51**						
4. Prosocial behavior T1	.32**	.22*	.26*					
5. Prosocial behavior T2	.37**	.26*	.26*	.69***				
6. Prosocial behavior T3	.21	.15	.14	.66**	.78**			
7. Problem behavior T1	-.06	-.08	-.17	-.69**	-.59**	-.65**		
8. Problem behavior T2	-.15	-.08	-.15	-.71**	-.74**	-.76**	.84**	
9. Problem behavior T3	-.07	-.01	-.08	-.57**	-.57**	-.83**	.71**	.81**

* $p < .05$, ** $p < .01$.

RESULTS

Preliminary Analyses

Univariate descriptive statistics confirmed the accuracy of data input, plausible means and ranges. Screening for missing data revealed that five subjects were missing the measures of prosocial and problem behavior at posttest. To retain these subjects, regression substitution was used to impute missing values. In addition, there were six single item values missing (less than 1% of total data) in the complete dataset that were imputed using the participant mean on other items from that measure at that time point. A square root transformation was employed on all dependent variables to address outliers, skewness and kurtosis. Levene's tests revealed homogeneity of variance, except for when examining prosocial behavior at posttest with initial level of problem behavior as a between-subject variable— $F(3, 76) = 4.78$, $p = .004$. This was corrected for in our “new statistics” effect size analyses; however, caution is warranted in interpreting the related ANOVA significance test. Table 2 presents means and *SDs*.

Before running the ANOVA significance tests we explored changes over time using Cumming's (2013) “new statistics” effect size analyses. The estimated mean difference in emotional understanding from pretest to midintervention was 2.70, 95% CI [1.45, 3.95]; from pretest to posttest it was 4.49, 95% CI [3.24, 5.74]; and from mid-intervention to posttest it was 1.79, 95% CI [0.59, 2.98]. The estimated mean difference in prosocial behavior from pretest to midintervention was 7.38, 95% CI [5.07, 9.68]; from pretest to posttest it was 8.44, 95% CI [5.52, 11.36]; and from midintervention to posttest it was 1.06, 95% CI [−1.37, 3.49]. The estimated mean difference in problem behavior from pretest to midintervention was −0.76, 95% CI [−2.32, 0.81]; from pretest to posttest it was 1.96, 95% CI [−0.54, 4.46]; and from midintervention to posttest it was 2.72, 95% CI [0.64, 4.79] (Figure 1). These analyses suggest that there is a difference between all of the time points for emotional understanding, and from pretest to midintervention and posttest for prosocial behavior. The analyses also suggest a difference in problem behavior between midintervention and posttest, although not in the predicted direction.

Emotional Understanding

To examine whether the intervention was associated with changes in emotional understanding, we ran a mixed ANOVA with time as a within-subject factor, gender and initial level of problem behaviors as between-subject factors, and emotional understanding as the dependent variable.

Table 2
Means and SDs of Dependent Variables for Combined Sample and by Group

Group	n	Pretest		Midintervention		Posttest	
		M	SD	M	SD	M	SD
Emotional understanding	80	47.57	7.07	50.28	5.88	52.06	4.80
Females	37	46.08	7.44	50.57	5.25	52.35	3.85
Males	43	48.85	6.54	50.02	6.44	51.81	5.52
Low problem behavior	41	49.02	7.44	51.32	5.72	53.12	4.72
High problem behavior	39	46.05	6.39	49.18	5.93	50.95	4.69
Prosocial behavior	80	27.99	9.16	35.37	14.27	36.43	17.19
Females	37	28.32	9.20	36.98	15.61	39.28	17.23
Males	43	27.70	9.22	33.98	13.03	33.97	16.97
Low problem behavior	41	34.32	6.82	45.07	11.25	48.58	10.99
High problem behavior	39	21.33	6.06	25.16	9.02	23.65	12.66
Problem behavior	80	13.80	12.87	13.04	12.09	15.76	15.80
Females	37	12.92	13.25	12.65	13.09	13.78	15.56
Males	43	14.56	12.64	13.38	11.32	17.47	15.98
Low problem behavior	41	3.27	4.40	3.66	4.75	4.62	6.05
High problem behavior	39	24.87	8.85	22.91	9.24	27.47	14.34

Mauchly's test indicated that the assumption of sphericity was not violated— $\chi^2(2) = .06, p = .97$. There was a significant main effect of time on emotional understanding— $F(2, 152) = 29.03, p < .001, \eta_p^2 = .28$. Contrasts revealed that emotional understanding was significantly lower at pretest than at midintervention— $F(1,76) = 20.41, p < .001, \eta_p^2 = .21$ —and posttest— $F(1,76) = 55.91, p < .001, \eta_p^2 = .42$. In addition, emotional understanding was significantly lower at midintervention than at posttest— $F(1,76) = 9.73, p = .003, \eta_p^2 = .11$. There was also a significant main effect of initial level of problem behavior on emotional understanding, indicating student with low initial levels of problem behavior demonstrated more emotional understanding— $F(1,76) = 6.37, p = .014, \eta_p^2 = .08$. There was no significant main effect of gender— $F(1, 76) = .59, p = .45, \eta_p^2 = .01$.

There was a significant interaction effect between time and gender— $F(2, 152) = 4.69, p = .011, \eta_p^2 = .06$, indicating that changes in emotional understanding over time varied by gender. Contrasts revealed significant interactions when comparing boys and girls emotional understanding at pretest to midintervention— $F(1,76) = 7.54, p = .008, \eta_p^2 = .09$ —and pretest to posttest— $F(1,76) = 6.49, p = .013, \eta_p^2 = .08$. Examining the graph of marginal means revealed that girls had lower emotional understanding than boys at pretest, but demonstrated more of an increase in emotional understanding than boys from pretest to midintervention, matching boys' level of emotional understanding at midintervention and posttest. There was not a significant interaction of time and initial level of problem behavior— $F(2, 152) = .45, p = .64, \eta_p^2 = .01$; gender and initial level of problem behavior— $F(1, 76) = 1.60, p = .21, \eta_p^2 = .02$; or a three-way interaction of time, gender, and initial level of problem behavior— $F(2, 152) = .58, p = .56, \eta_p^2 = .01$.

Prosocial Behavior

To examine whether the intervention was associated with changes in prosocial behavior, we ran a mixed ANOVA with time as a within-subject factor, gender and initial level of problem behaviors as between-subject factors, and prosocial behavior as the dependent variable. Mauchly's test indicated

that the assumption of sphericity was violated— $\chi^2(2) = 8.54, p = .01$. Therefore, we corrected degrees of freedom using Greenhouse–Geisser estimates ($\epsilon = .90$). There was a significant main effect of time on prosocial behavior— $F(1.81, 137.23) = 16.81, p < .001, \eta_p^2 = .18$. Contrasts revealed that prosocial behavior was significantly lower at pretest than at midintervention— $F(1,76) = 37.12, p < .001, \eta_p^2 = .33$ —and at posttest— $F(1,76) = 20.09, p < .001, \eta_p^2 = .21$. There was also a significant main effect of initial level of problem behavior on prosocial behavior— $F(1,76) = 114.04, p < .001, \eta_p^2 = .60$. There was no significant main effect of gender— $F(1, 76) = 1.14, p = .29, \eta_p^2 = .02$.

There was a significant interaction effect between time and initial level of problem behavior— $F(1.81, 137.23) = 9.54, p < .001, \eta_p^2 = .11$, indicating that changes in prosocial behavior across time varied by initial level of problem behavior. Contrasts revealed significant interactions when comparing children high and low in initial level of problem behavior in their prosocial behaviors at pretest to midintervention— $F(1,76) = 6.29, p = .014, \eta_p^2 = .08$ —and pretest to posttest— $F(1,76) = 15.36, p < .001, \eta_p^2 = .17$. There was also a trend toward a significant interaction when comparing midintervention to posttest— $F(1,76) = 4.88, p = .03, \eta_p^2 = .06$. Examining the graph of marginal means revealed that at pretest children with low levels of problem behavior exhibited more prosocial behavior than children with high levels of problem behavior, and that although both groups demonstrated an increase in prosocial behavior between pretest and midintervention, children with low initial levels of problem behavior demonstrated more of an increase than those with high initial levels of problem behavior. Furthermore, children with low initial levels of problem behavior continued to demonstrate an increase in prosocial behaviors from midintervention to posttest, whereas children with high initial levels of problem behaviors demonstrated a slight decrease in prosocial behavior from midintervention to posttest. There was not a significant interaction of time and gender— $F(1.81, 137.23) = 1.84, p = .17, \eta_p^2 = .02$; gender and initial level of problem behavior— $F(1, 76) = .90, p = .35, \eta_p^2 = .01$; or a three-way interaction of time, gender, and initial level of problem behavior— $F(1.81, 137.23) = .53, p = .58, \eta_p^2 = .01$.

Problem Behaviors

To examine whether the intervention was associated with changes in problem behavior, we ran a mixed ANOVA with time as a within-subject factor, gender as a between-subject factor, and problem behavior as the dependent variable. Mauchly's test indicated that the assumption of sphericity was violated— $\chi^2(2) = 12.74, p = .002$. Therefore, we corrected degrees of freedom using Greenhouse–Geisser estimates ($\epsilon = .87$). There was not a significant main effect of time on problem behavior— $F(1.74, 135.37) = 1.52, p = .23, \eta_p^2 = .02$ —or gender on problem behavior— $F(1, 78) = .63, p = .43, \eta_p^2 = .01$, indicating that problem behavior was similar over the course of the intervention and did not significantly differ between boys and girls. Finally, there was not a significant interaction effect between gender and time— $F(1.74, 135.37) = 1.70, p = .19, \eta_p^2 = .02$.

DISCUSSION

The results of this preliminary study suggest that an abbreviated version of the PATHS Preschool/Kindergarten Curriculum implemented by school mental health clinicians was associated with increases in emotional understanding and prosocial behavior, but not with decreases in problem behavior. When examining the entire sample, emotional understanding continued to improve over the entire course of the intervention, whereas prosocial behavior improved over the first half of the intervention and remained stable during the second half of the intervention.

These findings are consistent with the CPPRG (1999) evaluation of the PATHS program in first-grade classrooms, which did not find a significant effect of dosage of the PATHS program on

peer-rated aggression, or teacher-rated prosocial and problem behaviors. CPPRG examined dosage as a continuous variable, with teachers implementing on average 48.2 out of 57 first-grade lessons (84.56%) with a range of 13 to 57 lessons implemented by teachers. Although we looked at slightly younger students and all students received approximately half the program (47.73%), together these studies present a promising picture of the effectiveness of implementing abbreviated versions of the PATHS Curriculum when time and resources are limited. This is an important first step in understanding “how much is good enough” (Owens et al., 2014, p. 104), given that under real-world constraints it is very common for the dosage of SEL programs such as PATHS to be reduced (Durlak, 1998; Moore et al., 2013).

Despite these findings, it remains logical that more intervention should result in better outcomes. Although not finding an impact of dosage on behavioral outcomes, CPPRG (1999) found that increased dosage was related to improved classroom climate. Likewise, Connell et al. (1985) found that it took 40 to 50 classroom hours of a school-based health promotion program to produce stable effects for knowledge, attitudes, and behavior. An important next step in advancing our understanding of dosage is to determine how much intervention is needed before diminishing returns occur. We also need to examine *what* was implemented. Future research should focus on determining whether some SEL curricula lessons are more essential than others.

Our findings also expand understanding of the effectiveness of PATHS and other SEL programs when implemented by school-based mental health professionals. Although Durlak et al. (2011) found that teachers were more effective than nonschool personnel in implementing SEL, research on school-based professionals who are not teachers is noticeably absent from their review. The improvements in students’ emotional understanding and prosocial behavior in the current study support further involvement of school-based clinicians in implementation, as well as additional research on implementation by this group.

The lack of improvement in problem behavior found in the primary analyses for our study is consistent with other studies of universal SEL programs that found a limited impact on aggressive and disruptive behaviors (Cooke et al., 2007; Raimundo et al., 2013; Wilson & Lipsey, 2007). This may be due to the fact that many children receiving a universal intervention already have low levels of problem behavior, making reductions unlikely (Merrell, 2010). Cumming’s (2013) “new statistics” approach indicated that problem behavior increased from midintervention to posttest in our study, which may indicate an unanticipated negative outcome. However, there is some evidence that in a typical student population aggression naturally increases over the course of the school year and, thus, in the absence of a positive impact on problem behaviors we may have observed a natural increase (Cooke et al., 2007; Taub, 2002). In addition, changes in prosocial behaviors may need to precede changes in aggressive behaviors, so one may see improvements in prosocial behavior before improvements in problem behaviors, which are better examined by follow-up data (Cooke et al., 2007). This indicates that the need to examine SEL program outcomes over several years.

The results of this study provide preliminary support for differential outcomes of the intervention based on the recipients’ gender and preexisting level of problem behaviors. At pretest, girls in this study demonstrated a lower level of emotional understanding than boys, but girls caught up to and matched boys’ level of emotional understanding at midintervention and posttest. This finding is surprising, as previous research tends to show that girls are higher in emotional understanding than boys during the preschool and kindergarten years (Brown & Dunn, 1996). Furthermore, the fact that girls seem to have improved more than boys during the first half of the intervention is at odds with CPPRG (2010), who found that PATHS benefitted boys more than girls. It may be that girls in our study exhibited poorer performance than boys at pretest due to more discomfort working with an unfamiliar individual one-on-one, and that this discomfort was reduced with repeated administrations of the emotional understanding measure. Alternatively, it may be that girls began the study with a

lower level of emotional understanding, and the program was more beneficial to them because of this deficit. This would support increased benefit for those students with lower initial levels of emotional understanding compared to those with higher initial levels.

This study found that children with low initial levels of problem behavior consistently demonstrated higher levels of emotional understanding than children with high initial levels of problem behavior. They also began with higher levels of prosocial behavior and made greater gains in prosocial behavior during the first half of the intervention than those with high initial problem behaviors. Children with low initial levels of problem behavior then continued to make small gains in prosocial behavior during the second half of the intervention, whereas those with high initial problem behaviors slightly decreased in their prosocial behaviors. Thus, although both groups seem to have benefitted from the program at first, those students with low initial levels of problem behaviors seem to have achieved a more meaningful and sustained benefit. These findings can be contrasted with previous studies showing increased benefit of prevention programs for those with greater initial difficulties (Challen et al., 2010; Reid et al., 1999). However, our findings are similar to Raimundo et al. (2013), who found that average students seemed to benefit most from a universal SEL program. Our findings suggest that higher dosage may be necessary to reach children with higher needs, or, students with more behavioral difficulties may need additional, more intensive, and individualized supports to derived large and sustained benefits from participation in abbreviated SEL programs.

Limitations

The results of this study should be interpreted in light of several limitations. First, this study did not employ a control condition, which limits our ability to rule out the impact of maturation or contextual factors on outcomes. Future studies of this topic should employ quasi-experimental and experimental designs, including randomized control trials. Second, although teacher reports are one of the best ways to assess students' social behaviors, they are likely to reflect both real changes in behavior and the teachers' perceptions of the child (Merrell, Buchanan, & Tran, 2006). In addition, we did not achieve homogeneity of variance for the null hypothesis tests examining prosocial behavior at posttest with initial level of need as a between-subject variable so caution should be used when interpreting the related finding. External validity of this study is limited by the fact that all participants in this study came from an urban Montessori school, and most were African American and from low-income families.

Conclusions

This study offers preliminary support for the effectiveness of an abbreviated, clinician-implemented version of the PATHS Curriculum in improving emotional understanding and prosocial behavior for preschool and kindergarten students. Girls in this study started out at a lower level of emotional understanding, but caught up to their male peers by midintervention, indicating that although emotional understanding improved for both genders, improvements were greater for girls. In addition, children with low initial levels of problem behavior seem to have benefitted more from the intervention, continuing to increase in prosocial behavior across the entire intervention, whereas children with high initial levels of problem behavior demonstrated smaller gains in prosocial behavior that were limited to the first half of the intervention. Higher dosage or additional intervention may be needed to see more change in behavior for these higher-need students. Future research should continue to examine abbreviated and clinician-implemented SEL programs, focusing on which program aspects are most essential to maintain, student outcomes over several years, and differences in effectiveness based on a variety of student and implementer characteristics.

REFERENCES

- Berzenski, S. R., & Yates, T. M. (2013). Preschoolers' emotion knowledge and the differential effects of harsh punishment. *Journal of Family Psychology*, 27, 463–472. doi:10.1037/a0032910
- Brown, J. R., & Dunn, J. (1996). Continuities in emotional understanding from three to six years. *Child Development*, 67, 789–802. doi:10.2307/1131861
- Challen, A., Noden, P., West, A., & Machin, S. (2010). UK resilience programme evaluation: Second interim report (Research Report DFE-RR006). Retrieved from <https://www.gov.uk/government/publications/uk-resilience-programme-evaluation-second-interim-report>
- Conduct Problems Prevention Research Group. (1999). Initial impact of the Fast Track prevention trial for conduct problems: II. Classroom effects. *Journal of Consulting and Clinical Psychology*, 67, 648–657. doi:10.1037//0022-006X.67.5.648
- Conduct Problems Prevention Research Group. (2010). The effects of a multiyear universal social-emotional learning program: The role of student and school characteristics. *Journal of Consulting and Clinical Psychology*, 78, 156–168. doi:10.1037/a0018607
- Connell, D. B., Turner, R. R., & Mason, E. F. (1985). Summary of findings of the school health education evaluation: Health promotion effectiveness, implementation, and costs. *Journal of School Health*, 55, 316–321. doi:10.1111/j.1746-1561.1985.tb05656.x
- Cooke, M. K., Ford, J., Levine, J., Bourke, C., Newell, L., & Lapidus, G. (2007). The effects of city-wide implementation of “second step” on elementary school students' prosocial and aggressive behaviors. *Journal of Primary Prevention*, 28, 93–115. doi:10.1007/s10935-007-0080-1
- Cross, A. B., Gottfredson, D. C., Wilson, D. M., Rorie, M., & Connell, N. (2010). Implementation quality and positive experiences in after-school programs. *American Journal of Community Psychology*, 45, 370–380. doi:10.1007/s10464-010-9295-z
- Cumming, G. (2013). The new statistics: Why and how. *Psychological Science*, 25, 7–29. doi:10.1177/0956797613504966
- Cumming, G., & Finch, S. (2005). Inference by eye: Confidence intervals and how to read pictures of data. *American Psychologist*, 60, 170–180. doi:10.1037/0003-066X.60.2.170
- Dariotis, J. K., Bumbarger, B. K., Duncan, L. G., & Greenberg, M. T. (2008). How do implementation efforts relate to program adherence? Examining the role of organizational, implementer, and program factors. *Journal of Community Psychology*, 36, 744–760. doi:10.1002/jcop.20255
- Domitrovich, C. E., Cortes, R. C., & Greenberg, M. T. (2007). Improving young children's social and emotional competence: A randomized trial of the preschool “PATHS” curriculum. *The Journal of Primary Prevention*, 28, 67–91. doi:10.1007/s10935-007-0081-0
- Domitrovich, C. E., Greenberg, M. T., Kusché, C. A., & Cortes, R. C. (2008). PATHS preschool/kindergarten student evaluation. South Deerfield, MA: Channing Bete Company.
- Durlak, J. A. (1998). Why program implementation is important. *Journal of Prevention & Intervention in the Community*, 17, 5–18. doi:10.1300/J005v17n02_02
- Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41, 327–350. doi:10.1007/s10464-008-9165-0
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82, 405–432. doi:10.1111/j.1467-8624.2010.01564.x
- Forman, S. G., Shapiro, E. S., Codding, R. S., Gonzales, J. E., Reddy, L. A., Rosenfield, S. A., . . . Stoiber, K. C. (2013). Implementation science and school psychology. *School Psychology Quarterly*, 28, 77–100. doi: 10.1037/spq0000019
- Frydenberg, E., Lewis, R., Bugalski, K., Cotta, A., McCarthy, C., Luscombe-Smith, N., & Poole, C. (2004). Prevention is better than cure: Coping skills training for adolescents at school. *Education Psychology in Practice*, 20, 117–134. doi:10.1080/02667360410001691053
- Greenberg, M. T., Domitrovich, C., & Bumbarger, B. (2001). The preventions of mental disorders in school-aged children: Current state of the field. *Prevention & Treatment*, 4, 1–62. doi:10.1037/1522-3736.4.1.41a
- Greenberg, M. T., & Kusché, C. A. (1993). Promoting social and emotional development in deaf children: The PATHS project. Seattle, WA: University of Washington Press.
- Greenberg, M. T., Kusche, C. A., Cook, E. T., & Quamma, J. P. (1995). Promoting emotional competence in school-aged children: The effects of the PATHS curriculum. *Development and Psychopathology*, 7, 117–136. doi:10.1017/S0954579400006374
- Greenberg, M. T., Kusche, C., & Mihalic, S. F. (1998). Blueprints for violence prevention. Book ten: Promoting Alternative Thinking Strategies. Boulder, CO: Center for the Prevention of Violence.
- Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M. J. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist*, 58, 466–474. doi:10.1037/0003-066X.58.6-7.466

- Griffin, J. P., Jr., Chen, D., Eubanks, A., Brantley, K. M., & Willis, L. A. (2007). A randomized violence prevention trial with comparison: Responses by gender. *Journal of School Violence*, 6, 65–81. doi:10.1300/J202v06n01_05
- Kam, C. M., & Greenberg, M. T. (1999). Technical measurement report on teacher social competence rating scale. Unpublished report.
- Kam, C. M., Greenberg, M. T., & Kusche, C. A. (2004). Sustained effects of the PATHS curriculum on the social and psychological adjustment of children in special education. *Journal of Emotional and Behavioral Disorders*, 12, 66–78. doi:10.1177/10634266040120020101
- Kusché, C. A. (1985). The understanding of emotion concepts by deaf children: An assessment of an affective curriculum. *Dissertation Abstracts International*, 46(2-B), 647.
- Merrell, K. W. (2010). Linking prevention science and social emotional learning: The Oregon resiliency project. *Psychology in the Schools*, 47, 55–70. doi: 10.1002/pits.20451
- Merrell, K. W., Buchanan, R., & Tran, O. K. (2006). Relational aggression in children and adolescents: A review with implications for school settings. *Psychology in the Schools*, 43, 345–360. doi: 10.1002/pits.20145
- Metropolitan Area Child Study Research Group. (2002). A cognitive-ecological approach to preventing aggression in urban settings: Initial outcomes for high-risk children. *Journal of Consulting and Clinical Psychology*, 70, 179–194. doi:10.1037/0022-006X.70.1.179
- Moore, J. E., Bumbarger, B. L., & Cooper, B. R. (2013). Examining adaptations of evidence-based programs in natural contexts. *Journal of Primary Prevention*, 34, 147–161. doi: 0.1007/s10935-013-0303-6
- Owens, J. S., Lyons, A. R., Brandt, N. E., Warner, C. M., Nadeem, E., Spiel, C., & Wagner, M. (2014). Implementation science in school mental health: Key constructs in a developing research agenda. *School Mental Health*, 6, 99–111. doi: 10.1007/s12310-013-9115-3
- President's New Freedom Commission on Mental Health. (2003). *Achieving the promise: Transforming mental health care in America*. Final report for the President's New Freedom Commission on Mental Health (SMA Publication No. 03-3832). Rockville, MD: Author.
- Raimundo, R., Marques-Pinto, A., & Lima, M. L. (2013). The effects of a social-emotional learning program on elementary school children: The role of pupils' characteristics. *Psychology in the Schools*, 50, 165–180. doi: 10.1002/pits.21667
- Reid, J. B., Eddy, J. M., Fetrow, R. A., & Stoolmiller, M. (1999). Description and immediate impacts of a preventive intervention for conduct problems. *American Journal of Community Psychology*, 27, 483–517. doi: 10.1023/A:1022181111368
- Rhoades, B. L., Warren, H. K., Domitrovich, C. E., & Greenberg, M. T. (2011). Examining the link between preschool social-emotional competence and first grade academic achievement: The role of attention skills. *Early Childhood Research Quarterly*, 26, 182–191. doi:10.1016/j.ecresq.2010.07.003
- Swaim, R. C., & Kelly, K. (2008). Efficacy of a randomized trial of a community and school-based anti-violence media intervention among small-town middle school youth. *Prevention Science*, 9, 202–214. doi: 10.1007/s11121-008-0096-7
- Taub, J. (2002). Evaluation of the second step violence prevention program at a rural elementary school. *School Psychology Review*, 31, 186–200.
- Taylor, C. A., Liang, B., Tracy, A. J., Williams, L. M., & Seigle, P. (2002). Gender differences in middle school adjustment, physical fights, and social skills: Evaluation of a social competency program. *Journal of Primary Prevention*, 23, 259–272. doi:10.1023/A:1019976617776
- Wilson, S. J., & Lipsey, M. W. (2007). School-based interventions for aggressive and disruptive behavior: Update of a meta-analysis. *American Journal of Preventive Medicine*, 33, S130–S143. doi:10.1016/j.amepre.2007.04.011